SERVICE MANUAL

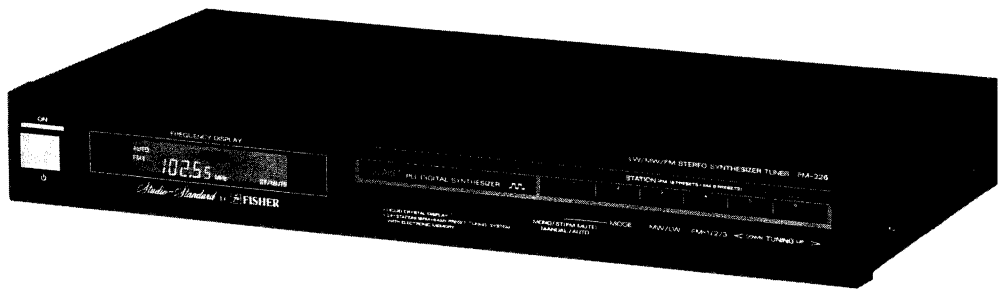
FISHER

LW/MW/FM STEREO SYNTHESIZER TUNER

FM-226/226T

(EUROPE)

This photo is for the model FM-226.



NOTE: There are two types on this tuner. One is with out Power Trans (FM-226) and the other is with Power Trans (FM-226T).

125 958 46 (FM-226)
125 958 47 (FM-226T)

SPECIFICATIONS

FM SECTION

Usable Sensitivity
- Mono ..... 3.5 μV/15.88 dBf
- Stereo ..... 15.0 μV/28.52 dBf

46 dB Quieting Sensitivity
- Mono ..... 20.0 μV/31.02 dBf
- Stereo ..... 100.0 μV/45.00 dBf

Signal-to-Noise Ratio
- Mono ..... 60 dB
- Stereo ..... 52 dB

Capture Ratio ..... 3.0 dB
Alt. Channel Selectivity (±400 kHz) ..... 50 dB
Image Response Ratio ..... 90 dB
Spurious Response Ratio ..... 80 dB
IF Response Ratio ..... 100 dB
AM Suppression Ratio ..... 50 dB
Total Harmonic Distortion at 50 dB Quieting
- Mono ..... 0.4 %
- Stereo ..... 0.5 %

Total Harmonic Distortion at 65 dBf
- Mono (100 Hz/1 kHz/6 kHz) ..... 0.4/0.3/0.3 %
- Stereo (100 Hz/1 kHz/6 kHz) ..... 0.8/0.6/0.6 %

Stereo Separation
- (100 Hz/1 kHz/10 kHz) ..... 30/33/25 dB

Sub-Carrier Rejection (19 kHz/38 kHz) ..... 28/40 dB
Audio Frequency Response
- (20 Hz – 15 kHz) ..... +1.0 dB/-3.0 dB

MW SECTION

Usable Sensitivity ..... 1260 μV/m
Selectivity (±9 kHz) ..... 33 dB
Signal-to-Noise Ratio ..... 50 dB
Image Response Ratio ..... 35 dB
IF Response Ratio ..... 55 dB

LW SECTION

Usable Sensitivity ..... 3160 μV/m
Selectivity (±9 kHz) ..... 33 dB
Signal-to-Noise Ratio ..... 50 dB
Image Response Ratio ..... 35 dB
IF Response Ratio ..... 60 dB

GENERAL

Power Requirements (50 Hz) (FM-226) ..... 16V AC
Power Requirements (50 Hz) (FM-226T) ..... 220V AC
Dimensions (W x H x D) ..... 400 x 56.5 x 210 mm
Weight (approx.) (FM-226) ..... 1.4 kg
Weight (approx.) (FM-226T) ..... 1.8 kg

– Specifications and design are subject to change without notice.–

REFERENCE No. WM-19649

CAUTION ON RF ADJUSTMENT

This model uses a microprocessor for memory preset control for the various bands.
This function has been used to preset frequency points for the different bands to permit adjustment and make it possible to check the function of the microprocessor. To use this supplemental function, ground initialize test point TP7 for 1 second before beginning adjustment.
The following table shows the initially preset frequencies.

Band	Memory					
	1	2	3	4	5	6
FM-1	87.5MHz	108MHz	88MHz	98MHz	108MHz	90MHz
MW/LW	603kHz	1404kHz	999kHz	160kHz	350kHz	250kHz

FM TUNER ALIGNMENT

FM ALIGNMENT – FUNCTION switch to FM ST/MUTE position.

ITEM	GENERATOR	DIAL SETTING	INDICATOR	PROCEDURE
1. FM IF S-CURVE ALIGNMENT	Connect 10.7MHz Radio IF Generator output to TP1 and ground lead to chassis. Use 5pF capacitor in series with generator output lead.	Position of non-interference Minimum Frequency.	Connect Radio IF Genescope input to TP5 and ground lead to chassis.	Adjust FM DET 1st Coil (T101) and FM DET 2nd Coil (T100) so that S-wave form becomes symmetrical.
2. DETECTOR ADJUSTMENT (MINIMUM T.H.D.)	Connect FM RF signal generator througt FM Dummy Antenna to FM Antenna terminals. Set generator output level to 60dBμV at 98MHz ±2kHz.	Set Preset STATION button to "4" position. Set to 98MHz.	Connect DC Voltmeter across TP3 and TP4.	Adjust FM DET 1st Coil (T101) until DC Voltmeter reads 0V ±50mV.
			Harmonic Distortion Analiyzer to TUNER OUT.	Adjust FM DET 2nd Coil (T100) for minimum gain and best linearity.
Note: Repeat Step 1 (FM DET 1st Coil T101) and 2 (FM DET 2nd Coil T100) until optimum alignment is reached.				
3. FM MUTING LEVEL ADJUSTMENT	Same as above. Adjust attenuator output level for 12dBμV.	Same as above.	Front panel TUNED Display Indicator.	Set MODE Switch to ST/MUTE. Adjust VR100 until the TUNDE Indicator partly light up.
Note: Decrease the output level of ATT and confirm that the wave form disappears. Increase the output level of ATT again and confirm that the input level meets the specifications sufficiently when the wave form has appeared.				
4. FM STEREO SIGNAL SEPARATION CONTROL	Connect FM Stereo SG to FM Antenna terminals. 19kHz signal ON. Main channel, sub channel signal ON. Apply 1000Hz signal from LEFT channel.		Connect AC VTVM and Oscilloscope to TUNER OUT.	Adjust VR101 for minimum output.
	Same as above for RIGHT channel.		Connect AC VTVM and Oscilloscope to TUNER OUT.	

Use a screwdriver with plastic grip for all adjustments.

MW/LW Frequency Cover Range
Tuning Voltage Value at TP2

(Table 1)

	153kHz	360kHz	522kHz	1611kHz
Minimum	0.7V	6.0V	1.0V	7.0V
Typical	0.93V	6.7V	1.3V	8.03V
Maximum	1.2V	8.0V	1.4V	9.0V

AM TUNER ALIGNMENT

AM ALIGNMENT – FUNCTION switch to MW or LW position.
Maintain generator output as low as possible for suitable indication.

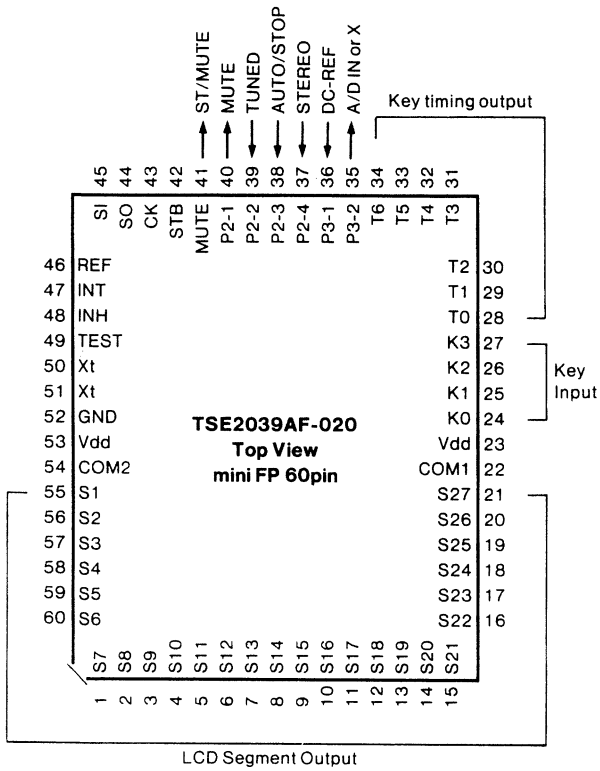
Note:
Perform this alignment after FM Tuner Alignment.

ITEM	GENERATOR	DIAL SETTING	INDICATOR	PROCEDURE
1. AM IF ALIGNMENT	Connect 450kHz Radio IF Genescope output to Pin 10 and 11 Adjust output level to 70dBμV.	Position of non-interference Minimum Frequency.	Connect Radio IF Genescope input to TP6 and ground lead to chassis.	Adjust AM IFT (T200) for maximum gain and best symmetry. Keep signal low enough for noise on responce.
2. MW RF FREQUENCY COVER ALIGNMENT (1611kHz)	Do not connect generator.	Front Panel DIGITAL Counter Display Set to 1611kHz.	Connect DC Voltmeter to TP2 and ground lead to chassis.	Check DC Voltmeter for Indication 7.0 ~ 9.0V.
3. (522kHz)	Same as above.	DIGITAL Counter Display Set to 522kHz.	Same as above.	Check DC Voltmeter for Indication 1.0 ~ 1.4V.
Note: Repeat the adjustments in Items 2 and 3. Then, confirm that each voltage becomes 1.0V to 9.0V at receving frequency of 522kHz to 1611kHz. **(See Table 1)**				
4. LW RF FREQUENCY COVER ALIGNMENT (360kHz)	Do not connect generator.	Front Panel DIGITAL Counter Display Set to 360kHz.	Connect DC Voltmeter to TP2 and ground lead to chassis.	Check DC Voltmeter for Indication 6.0 ~ 8.0V.
5. (153kHz)	Same as above.	DIGITAL Counter Display Set to 153kHz.	Same as above.	Check DC Voltmeter for Indication 0.7 ~ 1.2V.
Note: Repeat the adjustments in Items 4 and 5. Then, confirm that each voltage becomes 0.7V to 8.0V at receving frequency of 153kHz to 360kHz. **(See Table 1)**				
6. MW RF TRACKING ALIGNMENT (603kHz)	Connect Standard Loop Antenna to output terminal of AM RF Signal Generator. Place Loop Antenna 60cm away from Loop antenna (Unit). Generator Setting to 603kHz or 1404kHz. Modulate with 400Hz (30 % modulation).	Set Preset STATION button to "1" position. Set to 603kHz.	Connect AC VTVM and Oscilloscope to TUNER OUT.	Adjust MW ANT Coil (T201) for maximum gain output.
7. (1404kHz)		Change Preset STATION button to "2" position. Set to 1404kHz.	Same as above.	Adjust MW ANT Trimmer (TC200) for maximum gain output.
Note: Repeat the adjustments in Items 6 and 7. Then, confirm there is no tracking error.				
8. LW RF TRACKING ALIGNMENT (160kHz)	Change generator setting to 160kHz.	Set Preset STATION button to "4" position. Set to 160kHz.	Connect AC VTVM and Oscilloscope to TUNER OUT.	Adjust LW ANT Coil (T202) for maximum gain output.
9. (350kHz)	Change generator setting to 350kHz.	Change Preset STATION button to "5" position. Set to 350kHz.	Same as above.	Adjust LW ANT Trimmer (TC201) for maximum gain output.
Note: Repeat the adjustments in Items 8 and 9. Then, confirm there is no tracking error.				
10. AM AUTO STOP SENSITIVITY ADJUSTMENT	Change generator setting to 999kHz and output level to 60dBμV/m.	Set Preset STATION button to "3" position. Set to 999kHz.	Front Panel TUNED Indicator Display.	Adjust VR200 unil the Indicator partly light up.

Use a screwdriver with plastic grip for all adjustments.

CPU PORT DESIGNATIONS (TSE 2039AF-020)

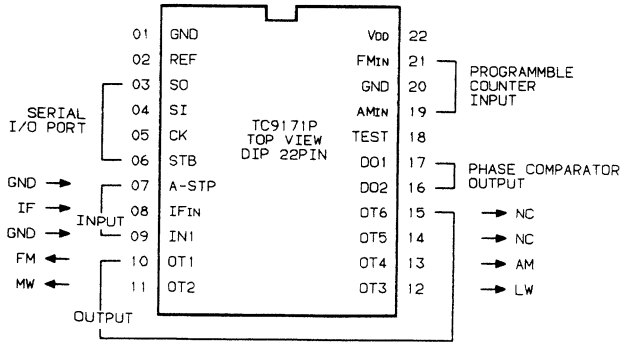
TSE 2039AF-020 OUTLINE



Port	Pin No.	Segment Name		Explanation of Function
		COM1	COM2	
COM1	22	COM1	–	Common 1
S27	21	AM	FM1	AM : MW (2 band) FM1 : FM1 band
S26	20	MW	FM2	MW : MW band FM2 : FM2 band
S25	19	LW	FM3	LW : LW band FM3 : FM3 band
S24	18	AUTO	MANUAL	AUTO : Auto Scan MANUAL : Manual Scan
S23	17	CH	1bc	CH : 6 CH 1bc : 108.00MHz segment
S22	16	[5]	STEREO	[5] : point 5 on level meter STEREO : Stereo In
S21	15	TUNED	MUTING	TUNED : Input On MUTING : Stereo/Mute On
S20	14	2f	2b	2f-a : 108.00MHz segment
S19	13	2e	2g	
S18	12	2d	2c	
S17	11	–	2a	
S16	10	3f	3b	3f-a : 108.00MHz segment
S15	9	3e	3g	
S14	8	3d	3c	
S13	7	FM dot	3a	: 108.00MHz mark
S12	6	4f	4b	4f-a : 108.00MHz segment
S11	5	4e	4g	
S10	4	4d	4c	
S9	3	[1]	4a	[1] : point 1 on level meter (normally ON)
S8	2	5g	5be	5g-f : 108.00MHz segment, 0/5
S7	1	5acdf	[2]	[2] : point 2 on level meter
S6	60	[3]	kHz	[3] : point 3 on level meter kHz : MW/LW unit
S5	59	[4]	MHz	[4] : point 4 on level meter MHz : FM unit
S4	58	7f	7b	7f-a : 6 CH segment
S3	57	7e	7g	
S2	56	7d	7c	
S1	55	MEMORY	7a	MEMORY : Store mode
COM2	54	–	COM2	Common 2

Port	Pin No.	Name	Assignment	Active	Initial
MUTE	41	ST/MUTE	Stereo/Mute Output	L	L
P2-1	40	MUTE	Mute Output	L	H
P2-2	39	TUNED	Tuned Input	L	–
P2-3	38	AUTO/STOP	Auto/Stop Input	L	–
P2-4	37	STEREO	Stereo Ind. Input	L	–
P3-1	36	DC-REF	A/D Ref Input	–	–
P3-2	35	A/D IN	Signal Meter Input	–	–
		or X	Function Output	H	L

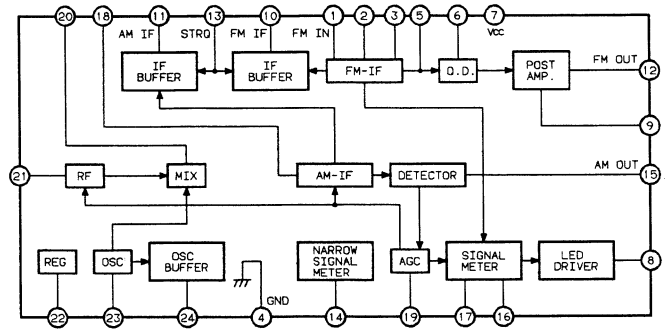
TC 9171P OUTLINE



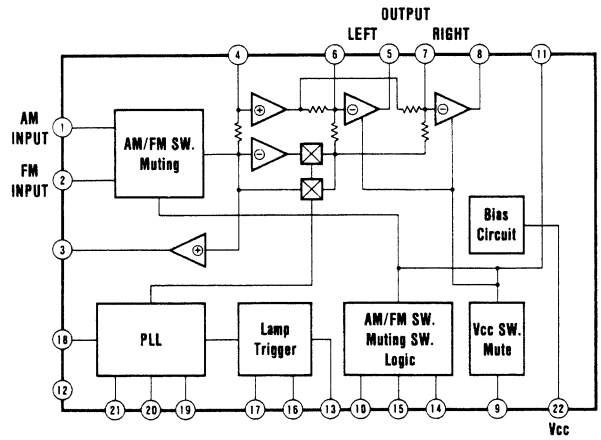
Port	Pin No.	Name	Assignment	Active	Initial
A-Stop	07	GND	Non Use Input	–	L
IF-IN	08	IF-IN	IF Input	–	–
IN1	09	GND	Non Use Input	–	L
OT1	10	FM	Band Output	H	H
OT2	11	MW	Band Output	H	L
OT3	12	LW	Band Output	H	L
OT4	13	AM	Band Output	H	L
OT5	14	NC	Non Use Output	–	L
OT6	15	NC	Non Use Output	–	L

INTEGRATED CIRCUIT BLOCK DIAGRAM

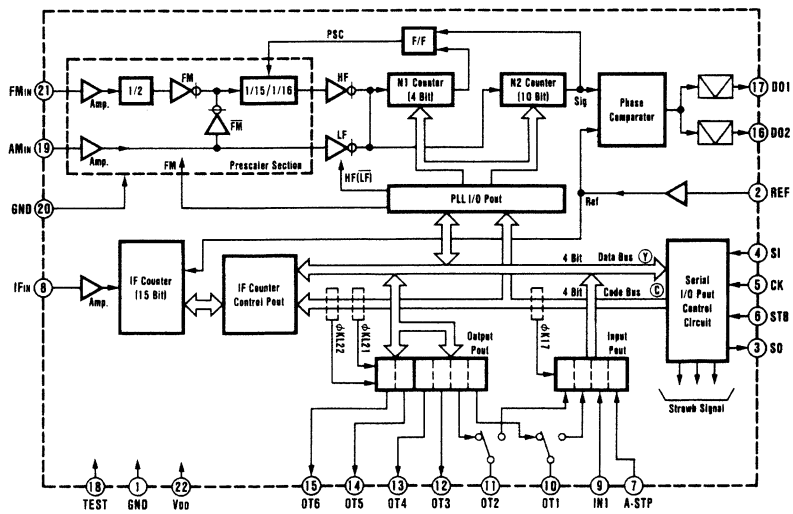
AM RF IF/FM IF IC LA 1266



FM MPX AM/FM SWITCH IC LA 3400



PRESCALER AND PLL CONTROL IC TC 9171P

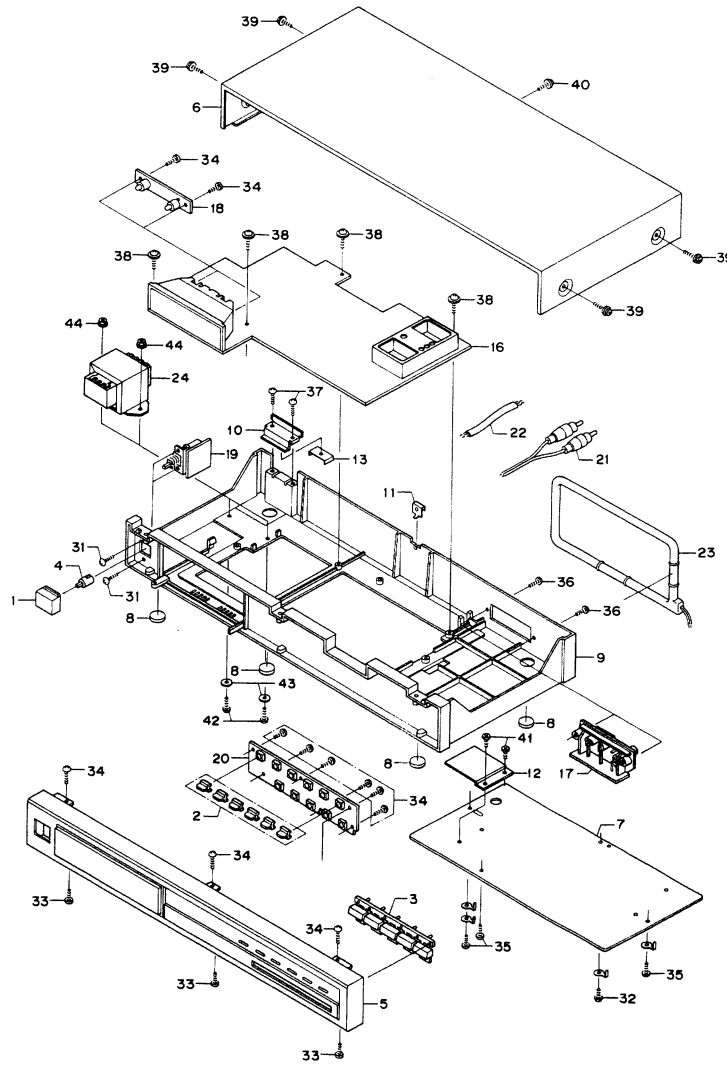


CABINET & CHASSIS PARTS LIST/EXPLODED VIEW

Ref. No.	Part No.	Description	Q'ty
	PACKAGE		
	131-6-3069-16840	Patching Sheet	1
	131-6-4559-11200	Serial No. Sheet	2
	141-6-1139-97025	Outer Cor.carton (FM-226T)	1
	141-6-1139-97024	Outer Cor.carton (FM-226)	1
	141-6-1449-97400	Case Styrofoam	2
	141-6-2519-10019	Poly Cover 100 X 190	1
	141-6-2519-22390	Sheet Polyethylene	1
	ACCESSORIES		
	131-0-4012-00180	FM Antenna Assy	1
	131-6-2719-10401	Bag Fan	1
	141-2-1729-00500	Holder Antenna	1
	142-6-4119-33432	Explanatory Booklet (FM-226T)	1
	142-6-4119-33433	Explanatory Booklet (FM-226)	1
	CABINET & CHASSIS		
	403 074 2701	CERAMIC 0.047U Z 50V [C900]	1
	4-2379-21520	Terminal Lug	2
	131-2-7103-54700	Label (FM-226T only)	1
	131-6-4559-11200	Serial No. Sheet	1
	141-2-1419-25518	Name Plate (Rating)	1
1	131-2-1601-86200	Knob (Power)	1
2	131-2-1601-97100	Knob (Preset)	6
3	131-2-1601-99901	Knob (Function) (FM-226T)	1
3	131-2-1601-99900	Knob (Function) (FM-226)	1
4	131-2-4219-17100	Shaft	1
5	131-0-1016-46205	Cabinet Front Assy (FM-226T)	1
5	131-0-1016-46204	Cabinet Front Assy (FM-226)	1
	131-2-1110-41900	Plate Decorate (LCD)	1
	131-2-1110-42000	Plate Decorate	1
	131-2-1203-67304	Cabinet Front Assy (FM-226T)	1
	131-2-1203-67303	Cabinet Front Assy (FM-226)	1
6	141-2-1129-07001	Cover Top	1
7	131-2-1410-36000	Cover Bottom	1
8	131-2-1801-16200	Leg	4
9	131-2-3301-33301	Chassis	1
10	131-2-3608-17500	Cramp Wire (FM-226T)	1
10	131-2-3608-17300	Cramp Wire (FM-226)	1
11	141-2-3229-52100	Plate Earth	1
12	131-2-6107-31900	Plate Sever (FM-226T only)	1
13	131-2-6107-32100	Plate Sever (FM-226T only)	1
16	141-0-1939-20732	Tuner P.C.B Assy (FM-226T)	1
16	141-0-1939-20731	Tuner P.C.B Assy (FM-226)	1
17	141-0-1939-20741	Antenna Terminal P.C.B. Assy	1
18	141-0-1939-20750	Lamp P.C.B. Assy	1
19	141-0-1939-20760	Power SW. P.C.B. Assy	1
20	141-0-1939-20770	Keyboard SW. P.C.B. Assy	1
21	4-2369-74581	Plug Cord RCA (Output)	1
22	⚠ 4-2432-00071	Power Cord (FM-226T)	1
22	⚠ 4-2369-76820	Plug Cord Power (AC Power) (FM-226)	1
23	4-2579-71601	Loop Antenna	1
24	⚠ 4-2512-35321	Power Trans (FM-226T)	1
31	411 002 9005	SCR PAN 3X8	2
32	411 020 7700	SCR S-TPG BRZ 3X6	1
33	411 021 3206	SCR S-TPG BIN 2.6X8	3
34	411 020 5706	SCR S-TPG BRZ 2.6X8	11
35	411 020 8004	SCR S-TPG BRZ 3X8	3
36	411 099 9803	SCR S-TPG BRZ 3X8	2
37	411 020 6208	SCR S-TPG BRZ 3X12	2
38	131-2-4201-25201	+BRTS-B Sems 3X8	4
39	141-2-4219-33101	+BTS-B 3.0X8 Sems BL	4
40	131-2-4201-25303	+BRTS-B 3X10 BL Sems	1
41	131-2-4201-16901	+PTS-C M3.0X4 (FM-226T only)	2
42	411 002 6301	SCR PAN 3X10 (FM-226T only)	2
43	411 092 9503	Washer Z 3.2X8X1 (FM-226T only)	2
44	131-2-4202-12903	Flange Nut M3X8Z (FM-226T only)	2

NOTES:

1. Parts order must contain Model Number, Part Number and Description.
2. Ordering quantity of screws and resistors must be multiple of 10 pcs.



P.C.BOARD PARTS LIST

Ref. No.	Part No.	Description	Q'ty
	TUNER P.C.B. ASSY		
16	141-0-1939-20732	Tuner P.C.B Assy	1
	4-1259-72067	Front End	1
	(Component parts used in Front End are not serviceable and available.)		
	4-2359-79038	Connector 1P Assy	1
	111-2-6220-11100	Wire Wrap Terminal	17
	131-2-6201-33600	Plate Heat Sink (for IC5)	1
	131-2-6306-12200	Reflector	1
	131-2-6308-26400	Filter	1
	411 020 8004	SCR S-TPG BRZ 3X8	1
	411 021 2704	SCR S-TPG BIN 2.6X6	2
F100	4-2529-70510	Filter 1ST	1
F101	4-2529-70511	Filter 2ND	1
F104	4-2529-70231	Anti Birdie Filter	1
L101	4-2539-71420	Choke Coil (100μH)	1
L102	4-2539-71420	Choke Coil (100μH)	1
T100	4-2569-72230	IFT, FM DET 2ND	1
T101	4-2569-72220	IFT, FM DET 1ST	1
T200	4-2569-72030	AM IFT	1
T201	4-2579-71730	MW ANT Coil	1
T202	4-2579-71740	LW ANT Coil	1
T203	4-2589-72476	MW OSC Coil	1
T204	4-2589-72486	LW OSC Coil	1
CF100	4-2279-70080	Ceramic OSC	1
CF101	4-2272-00301	Ceramic Filter 10.7MHz	1
CF200	4-2272-00230	Ceram1c Filter 450kHz	1
CF400	4-2259-71060	Crystal 7.2MHz	1
TC200	4-2249-70581	Trimmer Condenser	1
TC201	4-2249-71160	Trimmer 20PF	1
VR100	4-2229-76560	Potentiometer (B-100kΩ)	1
VR101	4-2229-76560	Potentiometer (B-100kΩ)	1
VR200	4-2229-76561	Potentiometer (B-10kΩ)	1
	If necessary, replace both Diode D200, D201 (SVC 321) together with new ones which have the equivalent characteristics.		
D100	407 005 3805	DIODE DS442-BT	1
D200	407 000 4708	VARACTOR DI SVC321C-2	1
D201	407 000 4708	VARACTOR DI SVC321C-2	1
D202	407 008 0405	DIODE GMB01-BT	1
D203	407 005 3805	DIODE DS442-BT	1
D300	407 004 9105	DIODE DSF10C-BT	1
D301	407 004 9105	DIODE DSF10C-BT	1
D302	407 004 9105	DIODE DSF10C-BT	1
D303	407 004 9105	DIODE DSF10C-BT	1
D400	407 005 3805	DIODE DS442-BT	1
D403	407 005 3805	DIODE DS442-BT	1
D404	407 005 3805	DIODE DS442-BT	1
D407	407 005 3805	DIODE DS442-BT	1
D408	407 008 0405	DIODE GMB01-BT	1
D409	407 008 0405	DIODE GMB01-BT	1
D410	407 008 0405	DIODE GMB01-BT	1
LCD1	4-9549-70090	LCD, FTD6410	1
IC1	410 014 9607	IC TSE2039AF-020	1
IC2	409 072 1005	IC TC9171P	1
IC3	409 073 9505	IC LA1266	1
IC4	409 017 0803	IC LA3400	1
IC5	409 074 0808	IC LA5667	1
ICP1	⚠ 4-2349-70620	Protector ICP-5 (0.25A)	1
Q100	405 021 0808	TR 2SD1012-H	1
Q101	405 019 2708	TR 2SC536-F-NP	1
Q102	405 004 3901	TR 2SA608-E-NP	1
Q103	405 019 2708	TR 2SC536-F-NP	1
Q104	405 004 4502	TR 2SA608-F-NP	1

Ref. No.	Part No.	Description	Q'ty
Q105	405 019 2708	TR 2SC536-F-NP	1
Q106	405 004 3901	TR 2SA608-E-NP	1
Q107	405 021 0105	TR 2SD1012-F	1
Q108	405 021 0105	TR 2SD1012-F	1
Q200	405 027 0505	TR 2SK246-GR	1
Q201	405 021 0808	TR 2SD1012-H	1
Q202	405 019 2708	TR 2SC536-F-NP	1
Q203	405 019 2708	TR 2SC536-F-NP	1
Q204	405 019 2708	TR 2SC536-F-NP	1
Q205	405 004 4502	TR 2SA608-F-NP	1
Q206	405 019 2708	TR 2SC536-F-NP	1
Q400	405 027 0604	TR 2SK246-Y	1
Q401	405 019 8809	TR 2SC732TM-BL	1
C100	403 069 0705	CERAMIC 1000P K 50V	1
C102	403 069 8404	CERAMIC 0.01U Z 50V	1
C103	403 074 2701	CERAMIC 0.047U Z 50V	1
C104	403 074 2701	CERAMIC 0.047U Z 50V	1
C105	403 074 2701	CERAMIC 0.047U Z 50V	1
C106	403 074 2701	CERAMIC 0.047U Z 50V	1
C107	403 069 8404	CERAMIC 0.01U Z 50V	1
C108	403 044 0201	ELECT 47U M 16V	1
C109	403 069 8404	CERAMIC 0.01U Z 50V	1
C110	403 049 1609	ELECT 1U M 50V	1
C111	403 033 9406	CERAMIC 820P K 50V	1
C112	403 039 2906	ELECT 47U M 6.3V	1
C113	403 073 8407	CERAMIC 4700P K 50V	1
C114	403 024 8203	CERAMIC 390P K 50V	1
C115	403 049 1609	ELECT 1U M 50V	1
C116	403 069 8404	CERAMIC 0.01U Z 50V	1
C117	403 042 0302	ELECT 10U M 16V	1
C118	403 069 8404	CERAMIC 0.01U Z 50V	1
C119	403 042 0302	ELECT 10U M 16V	1
C120	403 049 1609	ELECT 1U M 50V	1
C121	403 048 7602	ELECT 0.47U M 50V	1
C122	403 050 1209	ELECT 2.2U M 50V	1
C123	403 069 8404	CERAMIC 0.01U Z 50V	1
C124	403 062 0900	POLYESTER 0.047U K 50V	1
C125	403 069 0705	CERAMIC 1000P K 50V	1
C126	403 024 8203	CERAMIC 390P K 50V	1
C127	403 024 8203	CERAMIC 390P K 50V	1
C128	403 049 1609	ELECT 1U M 50V	1
C129	403 049 1609	ELECT 1U M 50V	1
C130	403 073 8407	CERAMIC 4700P K 50V	1
C131	403 073 8407	CERAMIC 4700P K 50V	1
C132	403 042 0302	ELECT 10U M 16V	1
C133	403 038 2303	ELECT 100U M 6.3V	1
C201	403 026 5408	CERAMIC 47P K 50V	1
C202	403 074 2701	CERAMIC 0.047U Z 50V	1
C203	403 074 2701	CERAMIC 0.047U Z 50V	1
C204	403 074 2701	CERAMIC 0.047U Z 50V	1
C205	403 069 8404	CERAMIC 0.01U Z 50V	1
C206	403 031 0306	CERAMIC 68P K 50V	1
C207	403 016 9003	CERAMIC 20P J 50V	1
C208	403 088 4104	STYRENE 430P J 50V	1
C209	403 074 2701	CERAMIC 0.047U Z 50V	1
C210	403 088 1103	STYRENE 330P J 50V	1
C211	403 074 2701	CERAMIC 0.047U Z 50V	1
C212	403 069 9401	CERAMIC 0.01U Z 50V	1
C213	403 069 8404	CERAMIC 0.01U Z 50V	1
C214	403 047 1502	ELECT 4.7U M 25V	1
C215	403 050 7706	ELECT 3.3U M 50V	1
C216	403 047 1502	ELECT 4.7U M 25V	1
C217	403 073 1606	CERAMIC 0.033U Z 50V	1
C218	403 075 0508	CERAMIC 6800P K 50V	1
C219	403 042 0302	ELECT 10U M 16V	1
C220	403 050 1209	ELECT 2.2U M 50V	1

P.C.BOARD PARTS LIST(Continued)

Ref. No.	Part No.	Description	Q'ty
C221	403 008 5204	CERAMIC 10P D 50V	1
C222	403 069 8404	CERAMIC 0.01U Z 50V	1
C224	403 074 2701	CERAMIC 0.047U Z 50V	1
C250	403 069 8404	CERAMIC 0.01U Z 50V	1
C251	403 026 5408	CERAMIC 47P K 50V	1
C252	403 069 8404	CERAMIC 0.01U Z 50V	1
C255	403 069 8404	CERAMIC 0.01U Z 50V	1
C300	403 069 8404	CERAMIC 0.01U Z 50V	1
C301	403 069 8404	CERAMIC 0.01U Z 50V	1
C302	403 069 8404	CERAMIC 0.01U Z 50V	1
C303	403 069 8404	CERAMIC 0.01U Z 50V	1
C304	403 045 2808	ELECT 1000U M 25V	1
C305	403 042 0302	ELECT 10U M 16V	1
C306	403 040 2704	ELECT 22U M 10V	1
C307	403 049 1609	ELECT 1U M 50V	1
C407	403 069 8404	CERAMIC 0.01U Z 50V	1
C408	403 039 7802	ELECT 100U M 10V	1
C409	403 040 6603	ELECT 2200U M 10V	1
C410	403 022 5907	CERAMIC 33P J 50V	1
C411	403 022 5907	CERAMIC 33P J 50V	1
C415	403 069 8404	CERAMIC 0.01U Z 50V	1
C416	403 069 8404	CERAMIC 0.01U Z 50V	1
C418	403 069 8404	CERAMIC 0.01U Z 50V	1
C419	403 038 2303	ELECT 100U M 6.3V	1
C421	403 057 0908	POLYESTER 0.01U K 50V	1
C422	403 039 2906	ELECT 47U M 6.3V	1
C423	403 069 1504	CERAMIC 1000P K 50V	1
C424	403 049 1609	ELECT 1U M 50V	1
C425	403 044 0201	ELECT 47U M 16V	1
C426	403 069 8404	CERAMIC 0.01U Z 50V	1
C427	403 026 5408	CERAMIC 47P K 50V	1
C500	403 026 8201	CERAMIC 470P K 50V	1
R100	401 014 2408	CARBON 150 JA 1/4W	1
R101	401 012 4107	CARBON 100 JA 1/4W	1
R102	401 012 7009	CARBON 10K JA 1/4W	1
R103	401 019 9600	CARBON 47 JA 1/4W	1
R104	401 027 5502	CARBON 6.8K JA 1/6W	1
R105	401 026 1000	CARBON 2.7K JA 1/6W	1
R106	401 012 8105	CARBON 100K JA 1/4W	1
R107	401 027 0309	CARBON 47K JA 1/6W	1
R108	401 027 5502	CARBON 6.8K JA 1/6W	1
R109	401 016 4806	CARBON 22K JA 1/4W	1
R110	401 025 7805	CARBON 2.2K JA 1/6W	1
R111	401 026 7408	CARBON 39K JA 1/6W	1
R112	401 023 3700	CARBON 82K JA 1/4W	1
R113	401 016 4806	CARBON 22K JA 1/4W	1
R114	401 024 7707	CARBON 100K JA 1/6W	1
R115	401 027 0309	CARBON 47K JA 1/6W	1
R116	401 016 1102	CARBON 22 JA 1/4W	1
R117	401 018 3807	CARBON 3.3K JA 1/4W	1
R118	401 024 7004	CARBON 1K JA 1/6W	1
R119	401 020 2904	CARBON 47K JA 1/4W	1
R120	401 012 8105	CARBON 100K JA 1/4W	1
R121	401 024 7707	CARBON 100K JA 1/6W	1
R122	401 024 7400	CARBON 10K JA 1/6W	1
R123	401 026 4308	CARBON 3.3K JA 1/6W	1
R124	401 016 1102	CARBON 22 JA 1/4W	1
R125	401 012 7009	CARBON 10K JA 1/4W	1
R126	401 025 0004	CARBON 120K JA 1/6W	1
R127	401 025 0004	CARBON 120K JA 1/6W	1
R130	401 016 3809	CARBON 2.2K JA 1/4W	1
R131	401 016 3809	CARBON 2.2K JA 1/4W	1
R132	401 012 8105	CARBON 100K JA 1/4W	1
R133	401 012 8105	CARBON 100K JA 1/4W	1
R134	401 012 5708	CARBON 1K JA 1/4W	1
R135	401 012 5708	CARBON 1K JA 1/4W	1
R136	401 018 3807	CARBON 3.3K JA 1/4W	1
R137	401 018 3807	CARBON 3.3K JA 1/4W	1
R138	401 024 6700	CARBON 100 JA 1/6W	1
R139	401 012 8105	CARBON 100K JA 1/4W	1
R140	401 024 7004	CARBON 1K JA 1/6W	1
R141	401 012 7009	CARBON 10K JA 1/4W	1
R200	401 009 6602	CARBON 3.3K JA 1/2W	1
R201	401 024 7004	CARBON 1K JA 1/6W	1
R202	401 024 8001	CARBON 1M JA 1/6W	1
R203	401 026 6609	CARBON 390 JA 1/6W	1
R204	401 026 1000	CARBON 2.7K JA 1/6W	1
R205	401 012 9300	CARBON 1M JA 1/4W	1
R206	401 024 7004	CARBON 1K JA 1/6W	1
R207	401 021 3009	CARBON 5.6K JA 1/4W	1
R208	401 012 8105	CARBON 100K JA 1/4W	1
R209	401 012 8105	CARBON 100K JA 1/4W	1
R211	401 024 7707	CARBON 100K JA 1/6W	1
R212	401 024 7004	CARBON 1K JA 1/6W	1
R213	401 026 9907	CARBON 4.7K JA 1/6W	1
R214	401 025 1902	CARBON 15K JA 1/6W	1
R215	401 016 4806	CARBON 22K JA 1/4W	1
R216	401 016 4806	CARBON 22K JA 1/4W	1
R217	401 027 2600	CARBON 5.6K JA 1/6W	1
R218	401 012 4503	CARBON 100 JA 1/4W	1
R219	401 026 9907	CARBON 4.7K JA 1/6W	1
R220	401 018 3807	CARBON 3.3K JA 1/4W	1
R221	401 016 4806	CARBON 22K JA 1/4W	1
R222	401 026 9907	CARBON 4.7K JA 1/6W	1
R223	401 014 4105	CARBON 1.5K JA 1/4W	1
R224	401 027 0309	CARBON 47K JA 1/6W	1
R225	401 024 7707	CARBON 100K JA 1/6W	1
R226	401 018 3807	CARBON 3.3K JA 1/4W	1
R227	401 027 5502	CARBON 6.8K JA 1/6W	1
R229	401 025 7805	CARBON 2.2K JA 1/6W	1
R230	401 024 7707	CARBON 100K JA 1/6W	1
R240	401 025 7805	CARBON 2.2K JA 1/6W	1
R241	401 024 7004	CARBON 1K JA 1/6W	1
R242	401 016 4806	CARBON 22K JA 1/4W	1
R243	401 016 4806	CARBON 22K JA 1/4W	1
R301	401 024 7707	CARBON 100K JA 1/6W	1
R302	401 026 4605	CARBON 33K JA 1/6W	1
R304	401 024 7400	CARBON 10K JA 1/6W	1
R400	401 024 7400	CARBON 10K JA 1/6W	1
R401	401 024 7400	CARBON 10K JA 1/6W	1
R402	401 024 7400	CARBON 10K JA 1/6W	1
R403	401 024 7400	CARBON 10K JA 1/6W	1
R404	401 024 7400	CARBON 10K JA 1/6W	1
R405	401 024 7400	CARBON 10K JA 1/6W	1
R406	401 024 7400	CARBON 10K JA 1/6W	1
R407	401 024 6700	CARBON 100 JA 1/6W	1
R410	401 012 5708	CARBON 1K JA 1/4W	1
R414	401 012 7009	CARBON 10K JA 1/4W	1
R418	401 024 7707	CARBON 100K JA 1/6W	1
R420	401 012 5708	CARBON 1K JA 1/4W	1
R421	401 012 5708	CARBON 1K JA 1/4W	1
R422	401 026 9303	CARBON 47 JA 1/6W	1
R423	401 018 4903	CARBON 33K JA 1/4W	1
R424	401 027 5908	CARBON 68K JA 1/6W	1
R425	401 024 7400	CARBON 10K JA 1/6W	1
R426	401 027 2600	CARBON 5.6K JA 1/6W	1
R428	401 017 1804	CARBON 2.7K JA 1/4W	1
R429	401 017 1804	CARBON 2.7K JA 1/4W	1
R430	401 026 9600	CARBON 470 JA 1/6W	1
R431	401 020 0801	CARBON 470 JA 1/4W	1
R432	401 027 2600	CARBON 5.6K JA 1/6W	1
R433	401 024 7004	CARBON 1K JA 1/6W	1

P.C.BOARD PARTS LIST (Continued)

Ref. No.	Part No.	Description	Q'ty
R434	401 024 7400	CARBON 10K JA 1/6W	1
R435	401 012 5708	CARBON 1K JA 1/4W	1
R436	401 012 5708	CARBON 1K JA 1/4W	1

The following each part is not needed in the FM-226 circuit.

	4-2372-00830	EC Terminal 1P	1
C400	403 009 8105	CERAMIC 100P K 50V	1
C401	403 009 8105	CERAMIC 100P K 50V	1
C402	403 009 8105	CERAMIC 100P K 50V	1
C403	403 009 8105	CERAMIC 100P K 50V	1
C404	403 009 8105	CERAMIC 100P K 50V	1
C405	403 009 8105	CERAMIC 100P K 50V	1
C406	403 009 8105	CERAMIC 100P K 50V	1

ANTENNA TERMINAL P.C.B. ASSY

17	141-0-1939-20741	Antenna Terminal P.C.B. Assy	1
	4-2372-01141	ANT Terminal 3P (Antenna)	1
L1	4-2539-71610	Choke Coil (470μH)	1

LAMP P.C.B. ASSY

18	141-0-1939-20750	Lamp P.C.B. Assy	1
	4-6129-70760	Lamp	2
	131-2-4208-35900	Spacer	2

POWER SW. P.C.B. ASSY

19	141-0-1939-20760	Power SW. P.C.B. Assy	1
SW1	4-2319-76831	SW Push 1 Key (Power)	1
C1	403 069 8404	CERAMIC 0.01U Z 50V	1
C2	403 069 8404	CERAMIC 0.01U Z 50V	1

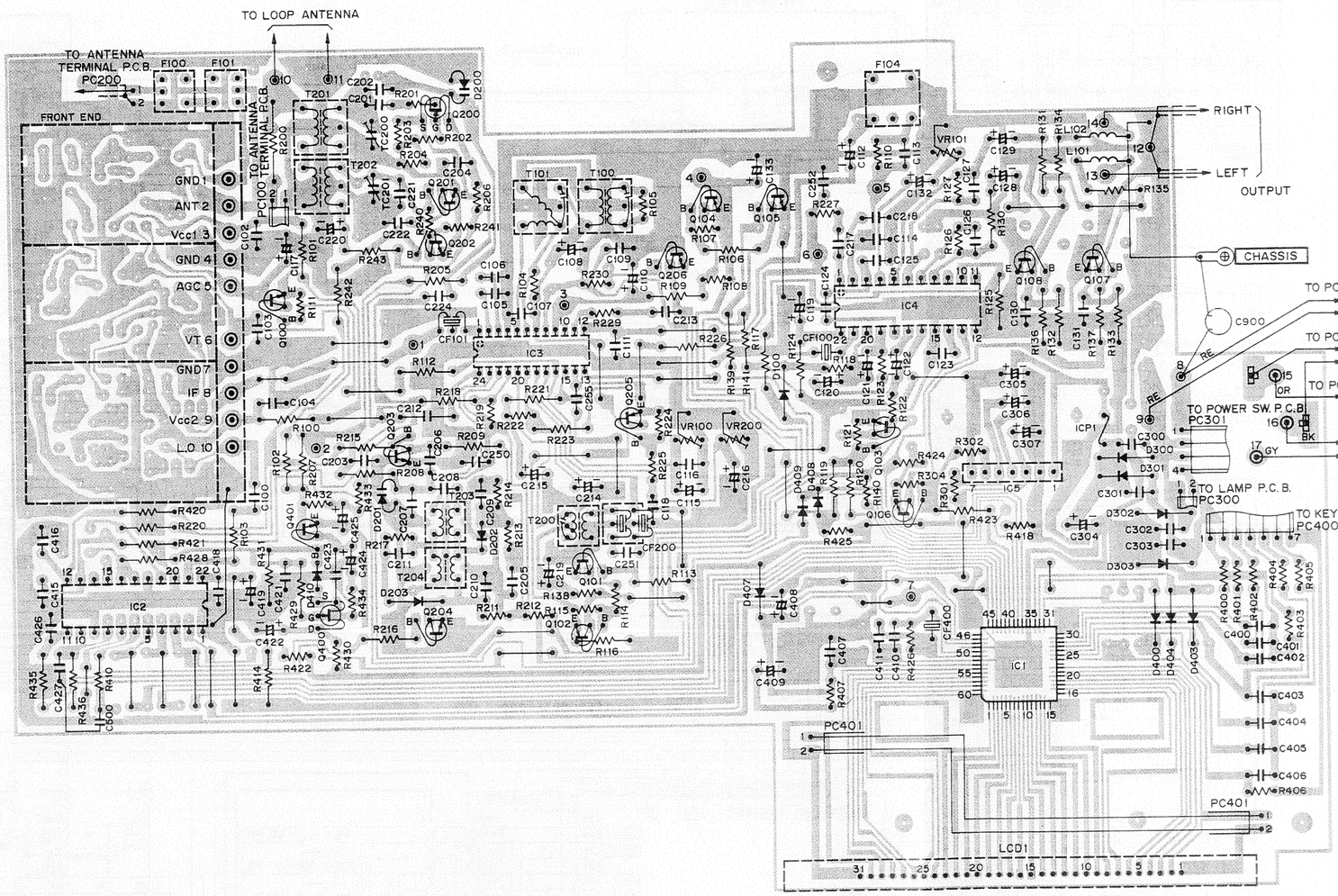
KEYBOARD SW. P.C.B. ASSY

20	141-0-1939-20770	Keyboard SW. P.C.B. Assy	1
SW1	4-2312-05801	Keyboard SW. (Preset Station 1)	1
SW2	4-2312-05801	Keyboard SW. (Preset Station 2)	1
SW3	4-2312-05801	Keyboard SW. (Preset Station 3)	1
SW4	4-2312-05801	Keyboard SW. (Preset Station 4)	1
SW5	4-2312-05801	Keyboard SW. (Preset Station 5)	1
SW6	4-2312-05801	Keyboard SW. (Preset Station 6)	1
SW7	4-2312-05801	Keyboard SW. (Up)	1
SW8	4-2312-05801	Keyboard SW. (Down)	1
SW9	4-2312-05801	Keyboard SW. (FM-1/2/3)	1
SW10	4-2312-05801	Keyboard SW. (MW/LW)	1
SW11	4-2312-05801	Keyboard SW. (Mode)	1

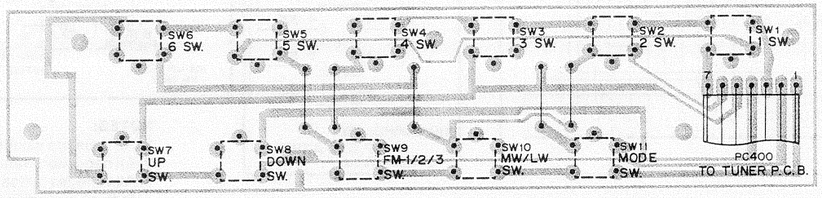
NOTES:

1. Parts order must contain Model Number, Part Number and Description.
2. Ordering quantity of screws and resistors must be multiple of 10 pcs.

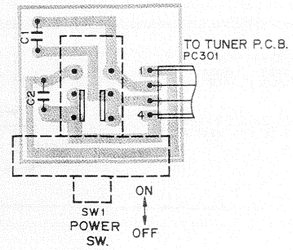
TUNER PRINTED CIRCUIT BOARD
(BOTTOM VIEW)



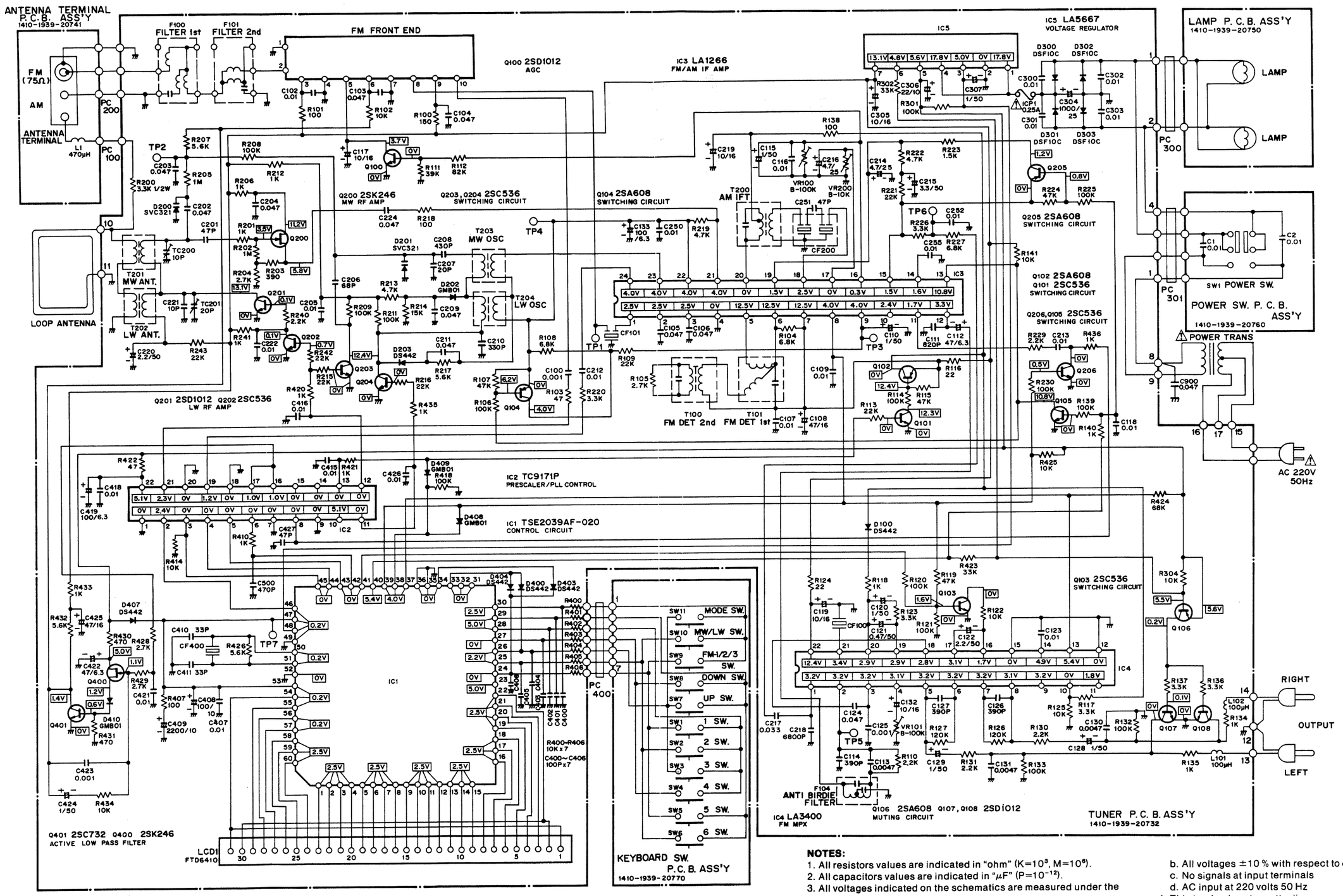
KEYBOARD SWITCH P.C.BOARD
(BOTTOM VIEW)



POWER SWITCH P.C.BOARD
(BOTTOM VIEW)



SCHEMATIC DIAGRAM (FM-226T)

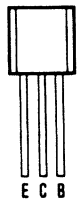
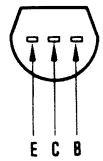
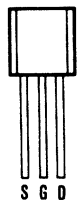
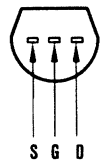
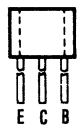
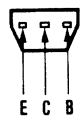


NOTES:

1. All resistors values are indicated in "ohm" (K=10^3, M=10^6).
2. All capacitors values are indicated in "μF" (P=10^{-12}).
3. All voltages indicated on the schematics are measured under the following conditions.
   a. Use a V.T.V.M.
   b. All voltages ±10 % with respect to chassis ground
   c. No signals at input terminals
   d. AC input at 220 volts 50 Hz
4. This is a basic schematic diagram.

Because Fisher products are subject to continuous improvement, Fisher Corporation reserves the right to make any changes or modifications without notice.

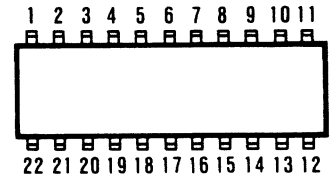
SEMICONDUCTOR LEAD IDENTIFICATION

TRANSISTOR	FRONT VIEW	BOTTOM VIEW
2SA 608 2SC 536 2SC 732		
2SK 246		
2SD 1012		

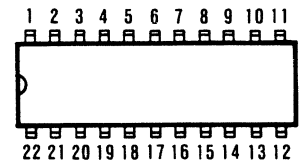
TERMINAL NAME

B → BASE	S → SOURCE
C → COLLECTOR	G → GATE
E → EMITTER	D → DRAIN

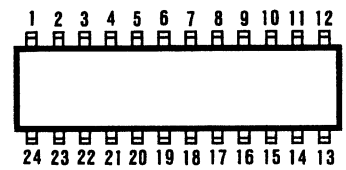
TC 9171 P BOTTOM VIEW



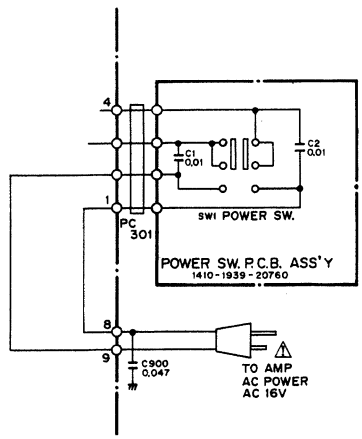
LA 3400 BOTTOM VIEW



LA 1266 BOTTOM VIEW



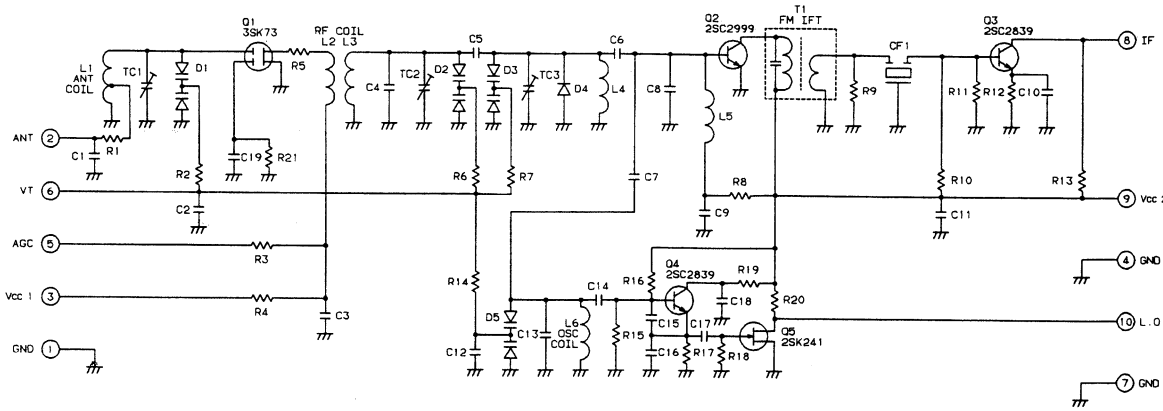
SCHEMATIC DIAGRAM (FM-226)



PRODUCT SAFETY NOTICE

Each precaution in this manual should be followed during servicing. Components identified with the IEC symbol ⚠ in the parts list and the schematic diagram designate components in which safety can be of special significance. When replacing a component identified with ⚠, use only the replacement parts designated, or parts with the same ratings of resistance, wattage or voltage that are designated in the parts list in this manual.
Leakage-current or resistance measurements must be made to determine that exposed parts are acceptably insulated from the supply circuit before returning the product to the customer.

FRONT END SCHEMATIC DIAGRAM



IMPORTANT NOTE

The tuner has been Factory-adjusted for operation on 220V AC. The voltage can be changed for operation on 110V AC by making the following changes on the tuner inside.

1. Remove the AC plug from the wall outlet.
2. Remove the screws securing the cover.
3. Disconnect Gray lead from Tuner P.C.Board Terminal No. 17, and then connect it to Tuner P.C.Board Terminal No. 15.
4. Disconnect Orange lead from Tuner P.C.Board Terminal No. 15, and then connect it to Tuner P.C.Board Terminal No. 17.

The tuner is now ready 110V operation. DO NOT attempt to operate the tuner on 220V. Damage will result!

FISHER Hi-Fi Europa Vertriebs GmbH

Stahlgruberring 4
8000 München 82

Tel: 089/420 45-0
Tlx: 524033

February/'87/2,000/K **Printed in Japan**